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er, cheaper, better

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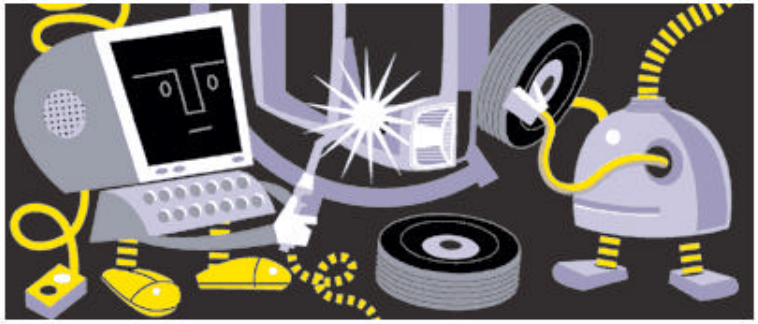


ost super machines are getting even more super

COMPUTING had its heyday in the 1980s. The field attracted many of the best minds in computer science, as start-ups and established companies vied fo
e of creating the fastest computer in the world. Interest in these high-powered beasts waned in the 1990s, as computing talent was drawn to the internet
n changing in recent years. The ability to build powerful computers cheaply, combined with growing commercial demand for high-end computing power,
g a renaissance in the field of supercomputing.

days, it is not necessary to design and build a supercomputer from scratch. Existing commercial components can be cheaply bolted together to create a v
ul system. Last year, a group at America's National Centre for Supercomputing Applications, in Illinois, built a supercomputer out of around a hundred
tion2 chips.

hile, another system, built by Virginia Tech, in Blacksburg, Virginia, was created from 1,100 Apple G5 chips and commercial off-the-shelf networking
nents. The $5.2m system was ranked as the third-fastest in the world. Such systems are of growing interest to corporate buyers, and led IBM to decide l
n selling supercomputer-class machines commercially.

onth, the Council on Competitiveness, a lobby group based in Washington, DC, organised a meeting of American supercomputer users. The range of atter
ated the growing industrial importance of supercomputing. Film studios, for instance, use them for everything from special effects to creating entire films
& Gamble, a household-goods company based in Cincinnati, Ohio has used them to redesign the manufacturing process for Pringles crisps.

usiness In The Beltway

.S. Plays Supercomputer Catch-up

tthew Swibel, 07.28.04, 6:00 AM ET

ASHINGTON, D.C. - Government miscalculations in the late 1990s out the willingness of private industry to research and build ercomputers have left the U.S. lagging behind the Japanese in this a and struggling to meet urgent national interests.

e $1 billion-a-year market for supercomputers is dwarfed by the $50 on-a-year market for servers, which has grown with Web-based nmerce and business computing.

chipmakers, rather than investing in supercomputers, have followed money into servers. And with federal investment in this area also ager, supercomputing in this century has meant stringing together sting commercial processors. It's true these "parallel processing" chines can go fast--Virginia Tech built the third-fastest machine in world for just $5.2 million with 1,100 G5 chips from **Apple mputer** (nasdaq: AAPL - news - people). But they have proven ceptionally difficult to program" and problematic at certain formance levels, according to a 2004 study by the President's High- d Computing Revitalization Task Force. Parallel processing has ved problematic for climate modeling and for certain manufacturing earch, such as attempts by automakers to simultaneously model the

Virginia Tech X

Terascale Computing Facility

- Third fastest computer in the World (November 2003)
- First academic computer to break 10 teraflops
- Currently being upgraded to XServes

Virginia Tech X

Terascale Computing Facility

Press Coverage

– The Wall Street Journal
– BBC
– The New York Times
– The Times of India
– Washington Post
– BusinessWeek
– Wired News
– InformationWeek
– Dozens of others...

THE WALL STREET JOURNAL.

BBC

The New York Times ON THE WEB

THE TIMES OF INDIA Powered by Indiatimes

Steve Jobs' keynote at MacWorld, January 2004

http://www.eng.vt.edu/tcf


QuickTime™ and a
MPEG-4 Video decompressor
are needed to see this picture.

National Lambda Rail

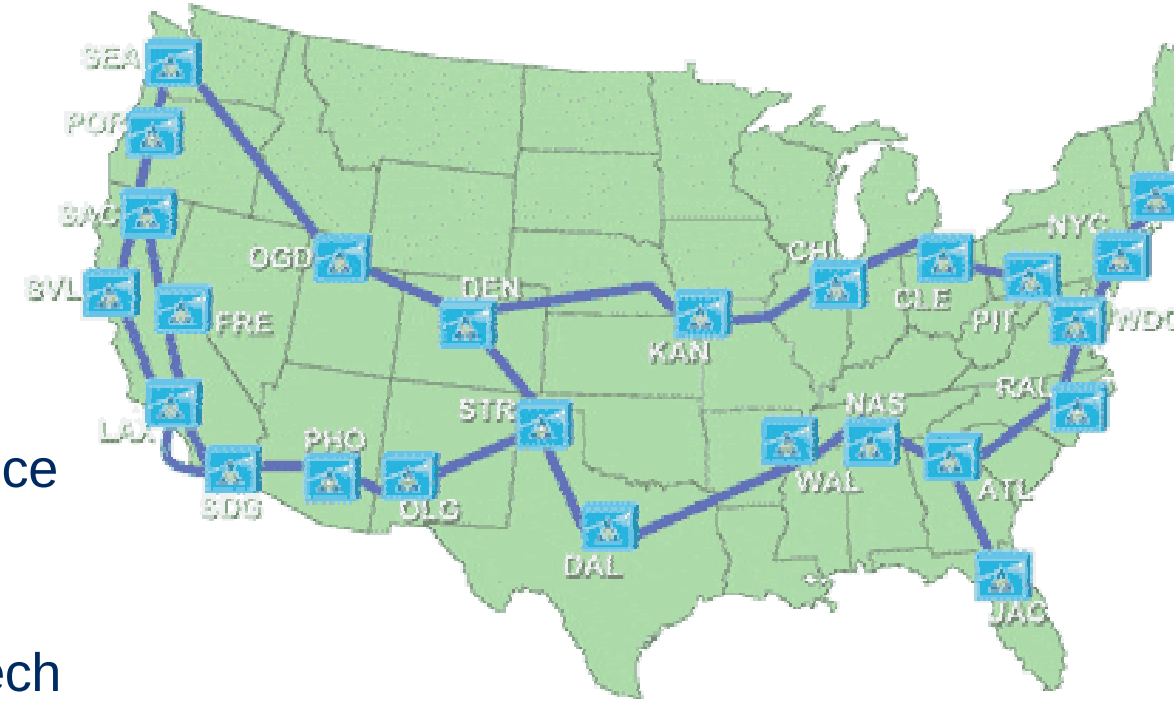
Next generation nationwide 40 Gb/s optical network

Consortium of industrial and research/academic members

Virginia Tech will manage the Washington, DC point of presence

Online Q1 or Q2 2004

Optical connection to Virginia Tech campus by Q4 2004



http://www.eng.vt.edu/tcf

Case Studies

San Diego SuperComputer Center (SDSC)

Pittsburgh SuperComputing Center (PSC)
U Pittsburgh, Carnegie-Mellon U, Westinghouse

National Center for SuperComputing Applications (NCSA), U Illinois at Urbana-Champaign

NCSA/UIUC	TCF/VT
and grant university	Land grant university
Geographically	“Geographically
hallenged”	challenged”
letscape	CDC/Déja Vu
pyglass	Tool set – VTLS?
Volfram Research	Science “killer app”

Software companies regard the San Diego region as an ideal location for technological innovation. Companies such as Fair Isaac and Company (formerly HNC Software), Maxim Systems, Lightspan, Oracle and SAIC thrive in San Diego due to the availability of skilled workers, the outstanding quality-of-life, access to capital and support organizations, and the presence of superior research institutions.

Tremendous growth in the region's software and computer services cluster is defining San Diego as a top spot in the nation for computer software, programming, systems integration, data processing, and other related computer services. Well-known titles such as Intuit's Turbo Tax, PacketVideo's multimedia decoding system, and HNC's CompAdvisor™ were produced or designed here.

SOFTWARE & COMPUTER SCIENCES WAGE DATA

SYSTEMS ADMINISTRATOR	$41,600-$63,700
SOFTWARE ENGINEER	$45,000-$80,000

Source: San Diego Workforce Partnership, Labor Market Survey 2001

SYSTEMS ANALYST	$50,018-$66,696
PROGRAMMER ANALYST	$52,126-$72,507
SOFTWARE DEVELOPEMENT MANAGER	$87,679-$116,417

Source: Eastridge INFOTECH, 2001-2002 San Diego Salary Survey

Facts-at-a-Glance

San Diego boasts nearly 1,440 software and computer services companies, employing more than 21,290 people.
SANDAG, 2001

The Software and Computer Services Cluster has grown rapidly and offers one of the highest wages of all employment clusters, 60% over the regional average.
San Diego Workforce Partnership, 2003

San Diego's software industry saw $82 million in venture capital investments in 2002. Nationally, San Diego ranked 8th for venture capital investments for years 2001 and 2002.
PricewaterhouseCoopers, Money Tree™ Survey, 2002

Rich with Resources

San Diego Supercomputer Center - one of the nation's two public research supercomputers calls this region home. With a staff of more than 100 scientists, software developers, and

To do/Wish list

Build academic program in Computational Science & Engineering (CSE) around facility

Bid for major, national center in cluster computing R&D

Form industry consortium/industrial affiliates program

Facility to act as showcase/incubator for private sector

Form consortium of research groups (including national labs); idea of VHPCC

Integrate with Institute for Critical Technology and Applied Science (ICTAS)

Satellite installation(s) at IALR, elsewhere?

Line item in State budget?